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Fluorescence photodetection of cancers involves the excitation of a chromophore with light and monitoring the emitted light as fluorescence. The combination of treating a cell in a subject suspected of having a neoplasia with a differentiating agent, and a light emitting agent, e.g., a photosensitizer or a fluorescent compound, allows for a marked increase in light emission upon differentiation of the cell, e.g., both for endogenous (autofluorescence) and exogenous fluorescence (induced fluorescence). This method can be performed *in vivo*, or a sample can be taken from a subject and performed *ex vivo*.

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The enhancement of contrast afforded by this method is useful for the *in vivo* detection of early neoplasias. Moreover, the improved contrast also provides a method of enhancing the delineation of margins of resection. For example, the present method can be used to determine the effectiveness of tumor treatment. For example, following tumor treatment, the efficacy of the treatment can be determined by using the method to determine any residual or new tumor growth, and if necessary the tumor can be retreated.